IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Kiyoshi Arita, et al.
Appln. No.	:	10/561,421
Filed	:	December 19, 2005
Title	:	PLASMA PROCESSING APPARATUS
Conf. No.	:	6392
TC/A.U.	:	1792
Examiner	:	Jeffrie Robert Lund
Customer No.	:	116
Docket No.	:	39102

REPLY BRIEF

STATUS OF THE CLAIMS

Each of claims 1-13 in the present proceeding stand rejected and is being appealed.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-6 and 9-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,625,526 to Watanabe et al. (hereinafter "Watanabe") in view of U.S. Patent No. 5,670,066 to Barnes et al. (hereinafter "Barnes"), U.S. Patent No. 6,815,646 to Ito et al. (hereinafter "Ito"), U.S. Patent No. 5,589,003 to Zhao et al. (hereinafter "Zhao") and U.S. Patent No. 6,164,633 to Mulligan et al. (hereinafter "Mulligan").

Claims 7 and 8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Barnes, Ito, Zhao and Mulligan, as applied to claims 1-6 and 9-13 above, and in further view of U.S. Patent Application Publication No. 2002/0179246 to Garabedian et al. (hereinafter "Garabedian") and U.S. Patent Application Publication No. 2003/0198005 to Sago et al. (hereinafter "Sago").

ARGUMENT

I. The combination of Watanabe, Barnes, Ito, Zhao and Mulligan does not render obvious the limitation of configuring an outer edge of a wafer lies within the boundaries of the insulating rings

In the Response to Argument section of the Examiner's Answer, the Examiner states that Barnes clearly discloses that the outer edge of the water is positioned on the electrode 38 within the boundaries of insulating ring 40. Applicants concede that the outer edges of wafer 32 of Barnes, when placed upon the electrostatic chuck 30, falls on electrode 38, which is provided between an inner surface portion of insulating coating 40 and an outer surface portion of insulating coating 40. The Examiner then states that the claims do not limit the presence of any other object such as electrode 38 upon which the wafer rests. Applicants strongly disagree. One skilled in the art would never look at an electrode, a metallic electrical conductor, the sides and bottom surface of which is coated with a relatively small amount of insulating material, as being equivalent to an insulating area.

Claim 1 and 9 recite that "the mounting face of the electrode member is divided into a first area...., a first insulating area..., a second area..., and a second insulating area." First, the term "face" is generally understood to refer to the exterior of an object and, in a "mounting face", the term is used consistently with such meaning because it is on the exterior of an object that something can be *mounted.* Since the "mounting face" refers to the exterior, the first area, the first insulating area, the second area and the second insulating area also refer to the exterior of the mounting face. In this regard, Barnes fails to disclose the limitation "a first insulating area, the surface of which is covered with an insulating film" because the insulating coating 40 is in the interior of the electrodes 34 and 38. If the Examiner's argument were accepted, it would be akin to saying that an electrode, whose composition included a minuscule amount of impurity usable as insulating material, is somehow "covered" the electrode even though the impurity was located in its interior simply because the electrode contacted the impurity somewhere within. The term "cover" generally denotes a relationship where a thing overlays or spreads over the outer surface of another thing. In fact, The American Heritage® Dictionary of the English Language, Fourth Edition defines "cover" as "to place something upon or over, so as to protect or conceal." http://dictionary1.classic.reference.com/browse/cover (accessed: May 15, 2009).

Accordingly, in the present claims, the limitation that the surface of the first insulating area is covered with an insulating film excludes the presence of the electrode 38, as the surface of the electrode 38 is neither protected nor concealed by the insulating coating 40. If the both the inner and outer portions of the insulating coating 40 and the electrode 38 are now considered as equivalent to the claimed first insulating area, it is clear that the insulating coating 40 does not cover the surface of the first insulating area. Instead, the insulating coating 40 merely displaces the electrode 38 rather than covering or protecting the surface thereof. Moreover, even if the exposed portion of the insulating coating 40, i.e., the inner and outer ring of the insulating coating 40, were deemed to "cover" a "first insulating area", the part between the inner and outer ring should not be interpreted also being a part of the first insulating area for the reasons discussed above. The electrode portion of this area has electrical conductive properties, which is the exact opposite as an insulating area. Thus, under such interpretation, the "first insulating area" could only be either the inner or outer ring of the insulating coating 40 and would exclude the area between the two rings. As a result, Barnes would not disclose the limitation that "a boundary between the first area and the first insulating area is designated inside the outer edge of a small wafer positioned in the center of the mounting face, and a boundary between the first insulating area and the second area is designated outside the outer edge of the small wafer" in claims 1 and 9.

Third, the Examiner asserts that the apparatus of Barnes is capable of supporting a wafer such that "a boundary between the second area and the second insulating area is designated inside the outer edge of a large wafer positioned in the center of the mounting face, and the second insulating area extends outward from the large wafer." In order to do this, a wafer would have to be placed on the top surface 36 of the Barnes apparatus with the outer edges of the wafer placed outside the boundaries of the insulating ring 40. Such an arrangement of the wafer would render the apparatus unsatisfactory for its intended purpose (MPEP § 2143.01). Barnes describes that the detection of whether workpiece 32 is properly positioned on the electrostatic chuck 30 is provided by measuring the capacitance between electrodes 34 and 38 prior to and subsequent to workpiece 32 being placed on the chuck (col. 4, lns. 32-36). There may be a capacitance change of approximately 50 percent from the capacitance between electrodes 34 and 38 prior to placement of a semiconductor wafer workpiece 32 on the chuck relative to the capacitance

these electrodes after the workpiece has been properly placed on the chuck (col. 4, lns. 36-42). Although the automatic positioning device 74 and arms 76 and 78 can attempt to reposition the workpiece 32, if the outer edges of the wafer are outside the boundaries of the insulating ring 40, the capacitance value will never approach the predetermined range meaning that the operation will never be able to advance from step 96 to step 98 under the modifications suggested by the Examiner (FIG. 2 and col. 5, lns. 41-63). The predetermined range of capacitance can only be reached when the outer edges of the wafer lie somewhere on the electrode 38. In other words, based on the modifications argued by the Examiner, the operation will eventually proceed to alarm step 108 and wafer processing step 100 will never be reached.

Therefore, the combination of the prior art references would fail to render obvious the claimed subject matter of claims 1 and 9.

III. Watanabe does not disclose a DC voltage application unit as asserted by the Examiner

Each of the independent claims (claims 1 and 9) of the present application includes the limitations "a DC voltage application unit, for applying a DC voltage to the electrode member to electrostatically attract the wafer positioned on the mounting face." In the examiner's answer of March 23, 2009, the examiner refers to the DC source below reference number 526 in FIG. 31 as describing the "DC voltage application unit." However, FIG. 31 shows that the DC source is used to power the heater 522 and is not used to create electrostatic attraction. Therefore, the examiner's assertion is not supported by the Watanabe reference.

Respectfully submitted,

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